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REMARKS

Claim 2 was objected to because, due to a typographical error, it depends on itself. This error is corrected to overcome the objection.

Claims 1 and 10 were rejected under 35 USC 112, second paragraph. The claims are amended herein to overcome the rejection.

Claims 1-10 were rejected under 35 USC 102 as being anticipated by Cox, Jr. et al, US Patent 5,515,367 (the '367 reference). Applicants respectfully traverse.

The Examiner asserts that the '376 reference teaches the method claimed by applicants, and in support of this assertion that Examiner cites col. 4, line 23 et seq. That is, the Examiner cites the entirety of the text, beginning with the summary of the invention. Respectfully, such an expansive citation is of no help to applicants to identify what the Examiner believes corresponds to the various steps in applicants' claims.

Substantively, applicants also do not agree with the Examiner's assertions.

The '367 reference teaches a method that utilizes selected mixed-integer programs to model the information obtained during iterative steps that include the determination of nodes within the SONET under review, identification of the number of periods within the selected time interval, the determination of demand between nodes over this time period, and the determination of discounted add-drop costs for a plurality of selected Add/Drop Multiplexers (ADM's) and related components based upon projected availability.

If the number of nodes under review is small, once this information is determined then the optimized discounted fixed and interconnection costs for this plurality of ADM's is determined in accordance with a first selected mixed integer program.

When the number of nodes under review is large, a heuristic approach is employed where required traffic is loaded to existing rings by repetitively identifying the smallest point-to-point demand between nodes on existing rings and assigning this demand to the rings, until no demand left may be routed. Thereafter, a proposed ring is created by identifying the greatest unsatisfied point-to-point demand between two adjacent nodes and assigning the nodes to the ring. At this point, new proposed rings may either be randomly generated until all demand has been satisfied or, in the alternative, existing rings may be expanded. If the latter step is selected, expansion is carried out by repetitively calculating the largest unsatisfied demand of neighbor nodes

for each of the proposed rings and identifying a plurality of neighbor nodes having the greatest unsatisfied demand. At that point, a determination may be made regarding the deficit of each of the proposed rings as well as the identification of a plurality of proposed rings with the greatest deficit.

Finally, one of the rings with the greatest deficit may be assigned to one of the neighbor nodes and inter-ring traffic may be loaded until all demand has been routed. Traffic is loaded through a process of repetitively identifying demand that can be routed the greatest distance through the smallest number of proposed rings and assigning that demand accordingly.

Once logical rings have been determined, whether in accordance with a mixed integer program or through repetitive iterations such as in the heuristic approach, the placement of physical self-healing rings and optimal traffic routing may thereafter be determined by retrieving the logical rings and preliminary routing information from memory and maximizing the percentage of demand covered and minimizing the total inter-ring traffic cost. This is accomplished through modeling the same in accordance with yet another mixed integer program and generating a corresponding electrical signal for receipt by said computer memory.

In contradistinction, claim 1 defines a method where the first step specifies a step of identifying a set of feasible rings of the network. That is, even before the loading on the network is considered, a set of feasible rings is identified. No such step is executed in the '367 reference method. The Examiner cites col. 6, lines 25 et seq. and col. 7, lines 48 et seq., but applicants respectfully disagree that the cited passages teach this step. The col. 6 text is primarily directed to describing the network. It does not teach any process, and certainly no process for identifying a feasible set of rings. The col. 7 text addresses the fact that a method is (later on in he reference) presented in the reference, but does not actually teach the method. In col. 8, lines 12-22 the presented method is summarized by:

> The method consists of three major iterations: logical ring design, i.e., the proposed placement of ADMs, physical ring design, i.e., the proposed placement of fiber loops, and optimal traffic routing. The logical ring design iteration determines the set of central offices where modified ADMs should be placed to form a SONET ring. Similarly, the physical ring design then assigns physical fiber links to connect the offices in the logical ring, which may include the placement of fiber

> links through switching offices that are not apportioned an ADM. Finally, the optimal traffic routing iteration decides how the point-to-point demand should best be routed among the established rings.

This, however, does not teach a step of determining a feasible set of rings in the given ring network, and it does not suggest that such a step exists in the method. Indeed, nowhere in the entirety of the '467 reference is such a step found. If the Examiner disagrees, it is respectfully requested that the Examiner point it out precisely.

The second step of claim 1 specifies a process for identifying a routing that minimizes "both the number of traffic demands that are not routed and an overall routing metric." The Examiner asserts that this step is disclosed in col. 8, lines 31 et seq. Applicants respectfully disagree. The expression that is minimized in the '367 reference is found at col. 9, lines 42-44 minimizes a sum that involves a discounted fixed cost of ADMs (a_{jk}), discounted optical inter-ring traffic costs (b_{jk}), and discounted optical inter-ring traffic costs (b_{jk}). Clearly, that is not a minimization of the number of traffic demands that are not routed.

The third step of claim 1 specifies identifying a set of rings from among the set of feasible rings that was identified in the first step. Since the set of feasible rings was not identified, it follows that the third step is not executed. Additionally, as indicated above, the '367 reference method does not identify a set of rings that minimizes a ring assignments cost measure that includes a cost associated with not covering routed demands with rings.

Based on the above, which demonstrates that none of the three steps defined in claim 1 is taught by the '367 reference, it is respectfully submitted that claim 1 is not anticipated by the '367 reference.

Claims 2-10 depend on claim 1 and, therefore, are believed to not be anticipated by the '367 reference. In addition, at least some of the dependent claims contain limitations that are neither found in nor suggested by the '367 reference.

With reference to claim 2, the Examiner asserts that the claimed subject matter is described in col. 11, lines 29, et seq. Applicants respectfully disagree. The cited text does speak of "fixing ring capacity," and indeed at col. 9, line 65 there is an expression which limits the number of nodes in a ring to a specified ring size. However, claim 2 specifies that the constraint specified in claim 1 requires "a feasible ring to have not more

than a given number of nodes, **and have a mileage cost that is not more than a given mileage cost,**" (emphasis supplied). It is respectfully submitted that the limitation expressed in the bold letters is not described or suggested by the '367 reference and, therefore, claim 2 is not anticipated by the '367 reference independently of the fact that it depends on claim 1.

As for claim 5, the Examiner asserts that the claim is described in col. 9, lines 20 et seq., and col. 12, lines 14 et seq. Applicants respectfully disagree. A description in the '367 reference that, in applicants' view, most closely relates to the claim 1 limitations is found in col. 11, lines 17 et seq. where it is stated:

> The ring generation portion of the present invention may be described as follows. At the outset, traffic must be loaded to existing fixed rings in order to account for existing capacity. Thus, the smallest point-to-point demand must be identified whose two end offices are on a single existing ring. Thereafter, the demand must be assigned to the ring subject to the ring capacity constraint. This procedure is repeated until no demand left can be routed. Thereafter, a fictitious network of central offices must be constructed by adding a link between two offices if there is currently fiber running between them or if the demand between them is greater than the length addition threshold.

Clearly, the above-quoted text does not describe or suggest the steps recited in claim 5. For example, the step of

> considering a routing path for each of said demands, starting with the demand having a lowest routing path cost

is not performed in the '367 reference, whether based on a table or not; and in fact no table that "identifies a path having a lowest routing path cost for each arbitrary pair of nodes of said network" is employed by the '367 reference at all. Therefore, it is believed that claim 5 is neither anticipated nor rendered obvious by the '367 reference.

The same argument applies to claim 7.

As for claim 8, it specifies that the table which identifies a path having the lowest routing path cost for each arbitrary pair of nodes of the network is pre-computed. The Examiner points to the demand matrix and the associated planner shown in FIG. 11. However, a demand matrix in the different time periods – even if it is considered as a table –simply does not correspond to, or is equivalent to, a table of lowest routing path costs. It simply contains different data.

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With respect to claim 10, the Examiner asserts that the '367 reference formula at col. 9, lines 20 et seq., and at col. 20 lines 14 et seq. are "the equivalent relationships." Applicants respectfully disagree. These relationships are equivalent only to the extent that both express an undertaking to minimize a relationship subject to certain constraints. However, neither that which is minimized nor the constraints are the same and, in fact, are quite different.

In light of the above amendments and remarks applicants respectfully submit that all of the Examiner's objections and rejections have been overcome. Reconsideration and allowance of the outstanding claims are respectfully solicited.

Respectfully,
Oktay Gunluk
John G. Klincewicz
Beth S. Munson

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By _____
Henry T. Brendzel
Reg. No. 26,844
Phone (973) 467-2025
Fax (973) 467-6589
email brendzel@home.com